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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

	Application No.	Applicant(s)
	10/790,138	SONG ET AL.
Office Action Summary	Examiner	Art Unit	
	DAVID N. WERNER	2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS,
WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _12 March 2008_.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
   closed in accordance with the practice under _Ex parte Quayle_, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-16_ is/are pending in the application.

   4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-16_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _28 September 2007_ is/are: a)☒ accepted or b)☐ objected to by the Examiner.

   Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

   Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   a)☐ All b)☐ Some * c)☐ None of:

   1.☐ Certified copies of the priority documents have been received.

   2.☐ Certified copies of the priority documents have been received in Application No. _____.

   3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
      application from the International Bureau (PCT Rule 17.2(a)).

   * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO/SB/08)
   Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
   Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

U.S. Patent and Trademark Office
PTOL-326 (Rev. 08-06)   **Office Action Summary**   Part of Paper No./Mail Date 20080528

DETAILED ACTION

1.   This Office action for US Patent Application 10/790,138 is in response to communications filed 12 March 2008, in reply to the Non-Final Rejection of 12 December 2007. Currently, claims 1-16 are pending.

2.   In the previous Office action, claims 11 and 14-16 were rejected under 35 U.S.C. 112, first paragraph, as introducing new matter. Claim 11 was rejected under 35 U.S.C. 102(b) as anticipated by US Patent 5,539,466 A (Igarashi et al.). Claims 1-3, 6-8, and 12-16 were rejected under 35 U.S.C. 103(a) as obvious over Igarashi et al. in view of US Patent 5,731,850 A (Maturi et al.), US Patent 5,168,356 A (Acampora et al.), and US Patent 5,185,819 A (Ng et al.). Claims 4, 5, 9, and 10 were rejected under 35 U.S.C. 103(a) as obvious over Igarashi et al., Maturi et al., Acampora et al., Ng. et al., and US Patent 5,878,166 A (Legall).

Response to Arguments

3.   Applicant's arguments, see Section II, filed 13 March 2008, with respect to claims 11 and 14-16 have been fully considered and are persuasive. The rejection under 35 U.S.C. 112, first paragraph of claims 11 and 14-16 has been withdrawn. See paragraph 48 of the specification, which does not recite interpolative mode SAD calculation.

4.   Applicant's arguments, see Section III, filed 13 March 2008, with respect to claim 11 have been fully considered but they are not persuasive. Applicant argues that

Igarashi et al. does not teach the limitations of calculating 6 SADs or eliminating interpolative SADs. In Igarashi et al., it is respectfully submitted that for every motion vector determined, an SAD is calculated (column 12: lines 43-60). Specifically, "The field motion detector 21 detects, every macroblock, motion vectors between fields and a sum of differences between absolute values of respective pixels" (column 12: lines 43-45), and "The frame motion detector 22 detects, every macroblock, motion vectors between frames and a sum of differences between absolute values of respective pixels" (column 12: lines 50-52). Additionally, please note that the recited eight field motion vectors of Igarashi et al. are those for both an odd field and an even field. The four field motion vectors for one of the two individual fields, with an additional forward frame motion vector and a backward frame motion vector (column 19: lines 1-8), are each necessarily associated with a sum of differences, which are the six differences required in the current invention. Additionally, while it is acknowledged that Igarashi et al. discloses bidirectional prediction as an average of forward and backward prediction (column 19: lines 9-10), it is respectfully submitted that the removal of interpolative prediction would produce a mere obvious variant, since it has been held that the omission of an element and its function in a combination where the remaining elements perform the same functions as before involves only routine skill in the art. See *In re Karlson*, 136 USPQ 184.

5.   Applicant's arguments, see Section IV, filed 13 March 2008, with respect to claims 1, 6, 12, and 13 have been fully considered but they are not persuasive.

Applicant argues, first, that Acampora teaches selecting a motion compensation mode based on a motion vector that produces a lowest distortion signal whereas the present invention discloses selecting a motion compensation mode according to a minimum SAD value, second, that Acampora et al. does not discloses the six motion compensation modes of the present invention, and that the combination of the references, particularly Igarashi et al. and Acampora et al. or Ng., would improperly change the principle of operation of Igarashi et al.

Regarding the "distortion signals" of Acampora et al., it is respectfully submitted that SAD is a known measure of distortion between a motion compensated current frame or block and a reference frame or block. Additionally, as shown above in the discussion of claim 11, Igarashi et al. inherently determines an associated SAD for each calculated motion vector, so that "the selection of an MV corresponds to that of an SAD", as argued. Regarding the six SADs allegedly not disclosed in Acampora et al., as shown above in the discussion of claim 11, Igarashi et al. was relied on to disclose this limitation. Applicant is reminded that one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Finally, regarding the combination of Igarashi et al. with a secondary reference, it is respectfully submitted that Igarashi et al. teaches motion compensation modes in which different motion predictions may be combined, such as an interpolated mode or a mode in which an average of field predictions is determined (column 19: lines 8-10, 34-38, 52-57). It is noted that these

were not used to disclose the claimed sums of top field and bottom field SADs in, for

example, step 1(a), due to ambiguous language. Therefore, it is respectfully submitted

that Igarashi et al. teaches the limitation of selecting an interpolative field MC mode or

frame MC mode. The Acampora and Ng references were used to demonstrate that this

is known as being dependent on a result of a threshold calculation.

Claim Rejections - 35 USC § 101

6.   35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or
> composition of matter, or any new and useful improvement thereof, may obtain a patent
> therefor, subject to the conditions and requirements of this title.

7.   Claim 13 is rejected under 35 U.S.C. 101 because the claimed invention is

directed to non-statutory subject matter.

The relevant portions of the USPTO "Interim Guidelines for Examination of

Patent Applications for Patent Subject Matter Eligibility" (O.G. Notice of 22 November

2005), Annex IV, read as follows:

> Descriptive material can be characterized as either "functional descriptive material" or
> "nonfunctional descriptive material." In this context, "functional descriptive material" consists
> of data structures and computer programs which impart functionality when employed as a
> computer component. (The definition of "data structure" is "a physical or logical relationship
> among data elements, designed to support specific data manipulation functions." *The New
> IEEE Standard Dictionary of Electrical and Electronics Terms* 308 (5th ed. 1993).)
> "Nonfunctional descriptive material" includes but is not limited to music, literary works and a
> compilation or mere arrangement of data.

> Both types of "descriptive material" are nonstatutory when claimed as descriptive
> material *per se. Warmerdam,* 33 F.3d at 1360, 31 USPQ2d at 1759. When functional
> descriptive material is recorded on some computer-readable medium it becomes structurally
> and functionally interrelated to the medium and will be statutory in most cases since use of
> technology permits the function of the descriptive material to be realized. Compare *In re
> Lowry,* 32 F.3d 1579, 1583-84, 32 USPQ2d 1031, 1035 (Fed. Cir. 1994) (claim to data
> structure stored on a computer readable medium that increases computer efficiency held
> statutory) and *Warmerdam,* 33 F.3d at 1360-61, 31 USPQ2d at 1759 (claim to computer

having a specific data structure stored in memory held statutory product-by-process claim) with *Warmerdam*, 33 F.3d at 1361, 31 USPQ2d at 1760 (claim to a data structure per se held nonstatutory).

Data structures not claimed as embodied in computer-readable media are descriptive material *per se* and are not statutory because they are not capable of causing functional change in the computer. See, e.g., *Warmerdam*, 33 F.3d at 1361, 31 USPQ2d at 1760 (claim to a data structure per se held nonstatutory). Such claimed data structures do not define any structural and functional interrelationships between the data structure and other claimed aspects of the invention which permit the data structure's functionality to be realized. In contrast, a claimed computer-readable medium encoded with a data structure defines structural and functional interrelationships between the data structure and the computer software and hardware components which permit the data structure's functionality to be realized, and is thus statutory.

Similarly, computer programs claimed as computer listings *per se*, i.e., the descriptions or expressions of the programs, are not physical "things." They are neither computer components nor statutory processes, as they are not "acts" being performed. Such claimed computer programs do not define any structural and functional interrelationships between the computer program and other claimed elements of a computer which permit the computer program's functionality to be realized. In contrast, a claimed computer-readable medium encoded with a computer program is a computer element which defines structural and functional interrelationships between the computer program and the rest of the computer which permit the computer program's functionality to be realized, and is thus statutory. See *Lowry*, 32 F.3d at 1583-84, 32 USPQ2d at 1035. Accordingly, it is important to distinguish claims that define descriptive material per se from claims that define statutory inventions.

Computer programs are often recited as part of a claim. USPTO personnel should determine whether the computer program is being claimed as part of an otherwise statutory manufacture or machine. In such a case, the claim remains statutory irrespective of the fact that a computer program is included in the claim. The same result occurs when a computer program is used in a computerized process where the computer executes the instructions set forth in the computer program. Only when the claimed invention taken as a whole is directed to a mere program listing, i.e., to only its description or expression, is it descriptive material per se and hence nonstatutory. Since a computer program is merely a set of instructions capable of being executed by a computer, the computer program itself is not a process and USPTO personnel should treat a claim for a computer program, without the computer-readable medium needed to realize the computer program's functionality, as nonstatutory functional descriptive material. When a computer program is claimed in a process where the computer is executing the computer program's instructions, USPTO personnel should treat the claim as a process claim. See paragraph IV.B.2 (b), below. When a computer program is recited in conjunction with a physical structure, such as a computer memory, USPTO personnel should treat the claim as a product claim.

Claims that recite nothing but the physical characteristics of a form of energy, such as a frequency, voltage, or the strength of a magnetic field, define energy or magnetism, per se, and as such are nonstatutory natural phenomena. *O'Reilly*, 56 U.S. (15 How.) at 112-14. Moreover, it does not appear that a claim reciting a signal encoded with functional descriptive material falls within any of the categories of patentable subject matter set forth in Sec. 101.

On the other hand, from a technological standpoint, a signal encoded with functional descriptive material is similar to a computer-readable memory encoded with functional descriptive material, in that they both create a functional interrelationship with a computer. In other words, a computer is able to execute the encoded functions, regardless of whether the format is a disk or a signal.

These interim guidelines propose that such signal claims are ineligible for patent
protection because they do not fall within any of the four statutory classes of Sec. 101.

Claim 13 specifies a "computer readable medium recording a program". This
claim language is insufficient to define structural and functional interrelationships
between the computer program and the computer-readable medium, since as it is
normally understood in the art, the term "recording" is usually associated with storing
data rather than executable code. It is suggested that the word "recording" be replaced
with a phrase such as "encoded with" or equivalent.

However, even if claim 13 were amended to proper form, this would fail to
present the claim as statutory, since the specification of the present invention, in
paragraph 59 as amended, defines the claimed computer readable medium as
encompassing statutory media such as "magnetic storage media" and "optically
readable medium" as well as *non-statutory* matter such as "a number of computer
systems connected via a network to effect distributed processing".

A signal embodying functional descriptive material is neither a process nor a
product (i.e., a tangible "thing") and therefore does not fall within one of the four
statutory classes of §101. Rather, a signal is a form of energy, in the absence of any
physical structure or tangible material. See *In re Nuijten*, 84 USPQ2d 1495, 85
USPQ2d 1927 (Fed. Cir. 2007, *en banc* denied 2008, *writ of cert. pending*).

Because the full scope of the claim as properly read in light of the disclosure
encompasses non-statutory subject matter, the claim as a whole is non-statutory.

Claim Rejections - 35 USC § 103

8.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

9.   Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over US

Patent 5,539,466 A (Igarashi et al.).

10.   Igarashi et al. teaches a coder for interlaced pictures. In one embodiment of

Igarashi, shown in figure 1, macroblock data is sent to a frame motion detector 22 and a

field motion detector 21 (column 12: lines 40-42). Frame motion detector 22 detects

motion vectors between the current frame and surrounding frames, and SAD values

between the current frame and surrounding frame, and outputs frame motion vector

FMMV and frame sum of absolute differences FMAD (column 12: lines 50-54). In case

of a B picture, the frame motion vector is chosen from the one of forward motion vector

FMVB, backward motion vector BMVB, and a bidirectional motion vector which is the

average of FMVB and BMVB, which produces the least predictive error (column 19:

lines 1-14). Field motion detector 21, similarly, detects motion vectors between the

current fields, and outputs field motion vector FDMV and associated field sum of

absolute differences FDAD (column 12: lines 44-49). Note that a SAD value is

determined for each motion vector. In case of a B frame, the field motion vector is

chosen from the one of forward FMVoBo between the previous odd field and current

odd field, forward FMVeBo between the previous even field and the current odd field,

forward FMVoBe between the previous odd field and the current even field, forward

FMVeBe between the previous even field and the current even field, backward BMVoBo

between the next odd field and the current odd field, backward BMVeBo between the

next even field and the current odd field, BMVoBe between the next odd field and the

current even field, and BMVeBe between the next even field and the current even field,

which produces the least predictive error (column 19: lines 15-40). For a current odd or

even field, the appropriate four of these eight field motion vectors are chosen. Next, the

frame and field MV and SAD values are transmitted to a prediction mode judgment

circuit 23 (column 12: lines 56-60), which determines if motion prediction will be carried

out in a field mode or frame mode by comparing the frame SADs to the field SADs. If

the difference FMAD-FDAD is greater than a threshold T1, then a field mode is chosen,

but if the difference FMAD-FDAD is smaller than T1, a frame mode is chosen (column

13: lines 6-21). If threshold T1 is set to 0, then the determination of field mode or frame

mode is directly measured from the minimum of field or frame SADs, since the

inequality $FMAD - FDAD > 0$ implies $FMAD > FDAD$.

The portions of the Field Motion Detector and Frame Motion Detector that find

forward motion vectors in Igarashi et al. correspond with the claimed "forward SAD

calculation unit", the portions of the Field Motion Detector and Frame Motion Detector

that find backward motion vectors correspond with the claimed "backward SAD

calculation unit", and the prediction mode judgment circuit corresponds with the claimed

"MC mode determination unit". The associated absolute differences of the four field

motion vectors for a current field and the forward and backward frame motion vectors correspond with the claimed six SADs.

Igarashi et al. discloses the claimed invention except Igarashi et al. also determines interpolative motion modes, which the present invention explicitly lacks. However, it would have been obvious to one having ordinary skill in the art at the time of the present invention to simplify Igarashi et al. by removing interpolation, since it has been held that the omission of an element and its function in a combination where the remaining elements perform the same functions as before involves only routine skill in the art. See *In re Karlson*, 136 USPQ 184.

11.   Claims 1-3, 6-8, and 12-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Igarashi et al. in view of US Patent 5,731,850 A (Maturi et al.), in view of US Patent 5,168,356 A (Acampora et al.), and in view of US Patent 5,185,819 A (Ng et al.).

As shown above, Igarashi et al. discloses determining whether to perform motion compensation on a macroblock in a frame mode or a field mode based on determining a minimum SAD value.   However, Igarashi et al. does not disclose a motion compensation mode in which a sum of a top field SAD and a bottom field SAD is determined, nor defaulting to an interpolative motion compensation mode if all SAD values are above a threshold.

As applicant recognizes, in Maturi et al., in an "entire macroblock" coding mode, "Motion Estimator 56 independently cumulates the SAD for the odd-odd field and the

SAD for the even-even field and merely adds these two SADs together" (column 12: lines 4-10), as well as a calculation of cumulating the SAD for the odd-even field and even-odd field (column 12: lines 11-19). The one of these two cumulative modes that produces the minimum SAD is selected as the "entire macroblock" coding mode (column 12: lines 28-33). Notice that the column 12 table of Maturi shows a cumulative "entire macroblock" coding mode for both forward and backward coding.

Igarashi et al. discloses portions of the claimed invention, but not determining the sum of a top field SAD and a bottom field SAD. Maturi et al. teaches that it was known to produce a motion compensation mode from the sum of an odd field SAD and the sum of an even field SAD. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the cumulative SAD generator of Maturi et al. to the field motion detector of Igarashi et al., since Maturi et al. states in column 12: line 10 that such a modification would add a new option for a motion compensation mode without calculating additional motion vectors.

Maturi et al. does not, however, resolve the deficiency of only selecting a motion compensation mode if a minimum SAD value is below a threshold, and encoding in an interpolative field or frame mode if the minimum SAD value is above a threshold.

Acampora et al. teaches a video encoder. This encoder includes element 104 which calculates a forward frame motion vector (column 7: lines 44-52), element 105 which calculates a backward frame motion vector (column 7: lines 53-56), and analyzer 106, which compares the distortion produced from the forward and backward motion vectors to a threshold (column 7: lines 57-58). Although Acampora et al. does not

explicitly teach using SAD as a distortion measure, the SADs, produced by Igarashi et al. with forward and backward frame motion vectors, were known in the art as common distortion measurements. If both the forward and backward frame distortions are larger than a threshold, a weighted interpolated frame according to the ratio of distortions is generated (column 7: lines 57-66). If the distortion signals are below the threshold, the motion vector that produces the smaller distortion is selected (column 7: line 67–column 7: line 3).

Ng et al. discloses a field mode version of the forward and backward motion vector generators and analyzer of Acampora et al. (column 7: lines 1-28).

Igarashi et al., combined with Maturi et al., discloses the claimed invention except for producing an interpolated frame or field if the motion vectors are above a threshold. Acampora et al. and Ng et al. teach that it was known to produce an interpolated data block if forward and backward motion vectors are above a threshold. Therefore, it would have been obvious to one having ordinary skill in the art to add the motion vector analyzers of Acampora et al. and Ng. et al. to the video coder of Igarashi et al., since Acampora et al. states in column 7: lines 57-67 that such a modification would produce a less distorted inter picture than from motion vectors alone if the motion vectors are unreliable.

Regarding claims 2, 3, 7, and 8, in Igarashi et al., the frame motion vector mode that produces a minimum predictive error is selected as the frame motion vector (column 19: lines 8-10), the field motion vector mode that produces a minimum

predictive error is selected as the field motion vector (column 20: lines 8-11) and the decision to chose the field mode or frame mode may be determined by which of the two produces a smaller sum of absolute differences (column 13: lines 6-21). In addition, in Maturi et al., the "entire macroblock" mode derived from the sum of an even field SAD and an odd field SAD is the one that produces a minimum SAD (column 12: lines 30-33), and in Acampora et al. and Ng et al., the motion vector that produces the minimum distortion signal is chosen as the motion vector if the distortion signals are below a threshold (column 8: lines 1-3).

Regarding claims 14-16, in Acampora et al. and Ng et al., the new distortion signal generated for the interpolated block is not used to determine whether to encode a block in a forward mode, backward mode, or interpolated mode, but only as a weighting factor once it has already been decided to encode the block in an interpolated mode.

12.   Claims 4, 5, 9, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Igarashi et al., Maturi et al., Acampora et al., and Ng et al. as applied to claims 1 and 6 above, and further in view of US Patent 5,878,166 A (Legall). Claims 4, 5, 9, and 10 are directed to selecting an interpolated field mode or interpolated frame mode based on SAD statistics. Acampora et al. teaches only interpolated frame motion compensation, and Ng et al. teaches only interpolated field motion compensation.

Legall teaches a video encoding method. Regarding claims 4, 5, 9, and 10, in Legall, a choice is made for each frame whether to encode the frame in a frame mode or in a field mode (column 3: lines 24-29). In addition, in a frame mode, individual

macroblocks may be encoded in a field mode or a frame mode (column 10: line 63–column 11: line 14). This decision is made by comparing a "frame activity" measure, which is the sum of absolute differences for every pixel in a block, and the sum of the two "field activity" measures (column 8: lines 41-54). If the frame activity is less than the field activity, a macroblock is encoded with frame encoding, but otherwise a macroblock is encoded with field encoding (column 11: lines 7-14). This corresponds with the claimed comparison of the sum of forward frame SAD and backward frame SAD and the sum of forward and backward field and frame SADs in claims 4 and 9 and the "combination of SADs" in claims 5 and 10.

Igarashi et al., Maturi et al., Acampora et al., and Ng et al., when combined, disclose the claimed invention except for determining whether to encode a block in a field mode or frame mode based on total SAD values of the field mode and frame mode. Legall teaches that it was known to make a field mode/frame mode determination for a macroblock based on comparing total SAD values of a frame and the sum of the SAD values of two fields. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to choose between frame mode and field mode based on total SAD activity, as taught by Legall, since Legall states in column 3: lines 24-54 that such a modification would enable an encoder to adapt to an optimized encoding mode with a more stable bit rate depending on the amount of movement in a video.

Conclusion

13.   Although there are no new references cited, this action is non-final due to the change in status of claim 11 from rejected under 35 U.S.C. 102 to rejected under 35 U.S.C. 103 and the new rejection of claim 13 under 35 U.S.C. 101.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David N. Werner whose telephone number is (571)272-9662. The examiner can normally be reached on MWF from 9:00-6:30, TR from 9:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mehrdad Dastouri, can be reached on (571) 272-7418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/D. N. W./
Examiner, Art Unit 2621

/Mehrdad Dastouri/
Supervisory Patent Examiner, Art Unit 2621